

Docket No.: NHL-HOL-65
Serial No.: 10/780,280
Customer No. 00432

Claim Amendments

1. (original) A beverage bottling plant for filling bottles with a liquid beverage filling material, said beverage bottling plant comprising:

a filling machine being configured to fill empty bottles with liquid beverage filling material;

a conveyer arrangement being configured and disposed to move empty bottles to said filling machine;

said beverage filling machine comprising a plurality of beverage filling positions, each beverage filling position comprising a beverage filling device for filling bottles with liquid beverage filling material;

said filling devices comprising an apparatus being configured to introduce a predetermined volume of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material;

said apparatus being configured to introduce a predetermined volume of liquid beverage filling material comprising an apparatus being configured to terminate the filling of beverage bottles upon liquid beverage filling material reaching said substantially predetermined level in bottles;

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a closing station being configured and disposed to close filled bottles;

a conveyer arrangement being configured and disposed to transfer filled bottles from said filling machine to said closing station;

a labeling station being configured and disposed to receive bottles to be labeled;

a conveyer arrangement being configured and disposed to convey bottles to said labeling station;

said labeling station comprising:

a frame structure, said frame structure having an axis disposed vertically;

a turntable structure being configured and disposed to rotate about said vertical axis of said frame structure, said turntable structure having a peripheral region;

a drive arrangement being configured and disposed to rotate said turntable structure about said vertical axis of said frame structure;

a plurality of support tables being configured to support and to rotate a bottle;

said support tables being disposed at said peripheral

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region of said turntable structure;

each support table having an axis disposed vertically about which vertical axis a support table can rotate;

each support table comprising a drive arrangement being configured and disposed to rotate its corresponding support table about its vertical support table axis, to permit rotation of a bottle supported on a support table;

a plurality of modules comprising:

a first module comprising:

at least one camera being configured and disposed to produce an image representative of the actual rotational position of a bottle supported on its corresponding support table adjacent said first module and to output signals representative of the image representative of the actual rotational position of a bottle;

a computer being configured and disposed to receive from said camera the output signals representative of the actual rotational position of a bottle, to compare the image representative of the actual rotational position with an image representative of a preset rotational position, and to

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output signals, to the drive arrangement of an adjacent support table, to energize the drive arrangement and thus to rotate to a first position said adjacent support table and a supported bottle;

a second module comprising:

at least one camera being configured and disposed to produce an image representative of the actual rotational position of a bottle supported on its corresponding support table adjacent said second module and to output signals representative of the image representative of the actual rotational position of a bottle;

a computer being configured and disposed to receive from said camera of said second module the output signals representative of the actual rotational position of a bottle, to compare the image representative of the actual rotational position with an image representative of a preset rotational position, and to output signals, to the drive arrangement of said support table adjacent said second module, to energize the drive arrangement and thus to rotate to a second position said support table adjacent said

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second module and a supported bottle;

said second position being of greater precision than
said first position;

a third module being configured and disposed to affix a
label to a bottle disposed in said second position on a support
table adjacent said third module;

a fourth module being configured and disposed to print
information on the label affixed to a bottle by said third,
labeling, module; and

a fifth module being configured and disposed to inspect for
the presence of a label on a bottle, and to determine the
position of a label on a bottle;

each of said modules comprising a first coupling structure;

a plurality of second coupling structures, each being
connected to said frame structure;

each first coupling structure being configured to be
connectable to and to be disconnectable from its corresponding
second coupling structure; and

each module being configured, upon connection to a
second coupling structure, to be disposed adjacent moving

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bottles supported on said support tables.

2. (original) The beverage bottling plant according to claim 1,
wherein:

said first coupling structure and a second coupling structure
together comprise a quick-connect and quick-disconnect structure;

each first coupling structure of each module is configured to be
interchangeably connected to a plurality of second coupling structures;

said third, labeling, module, said fourth, printing, module, said
fifth, inspecting, module each comprise a computer configured to
process signals;

each one of said plurality of modules comprises a bus system
configured and disposed to transfer signals from and to a
corresponding module;

at least one of said modules comprises an arrangement to
generate light;

at least one of: said first, alignment, module, said second,
alignment, module, and said fifth, inspecting, module comprises at
least one of: (i) and (ii), wherein (i) and (ii) comprise:

(i) a plurality of sensors configured and disposed to sense

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the presence a label affixed to a bottle; and

(ii) a plurality of sensors configured to sense the position of a label affixed to a bottle;

one of: (ii) and (iii), wherein (ii) and (iii) comprise:

(i) at least one of: said first, alignment, module, said second, alignment, module, and said fifth, inspecting, module is configured to sense a deviation of the actual position of a label affixed to a bottle by said third, labeling, module from a desired position of a label which label is to be added on a bottle; and

(ii) at least one of: said first, alignment, module, said second alignment, module, and said fifth, inspecting, module is configured to output signals to said third, labeling, module to minimize deviation of the actual position of a label affixed on a bottle by said third, labeling, module from the desired position of a label affixed on a bottle; and

said fifth, inspecting, module is configured to issue signals to said third, labeling, module to discontinue operation of said third, labeling, module.

3. (original) The beverage bottling plant according to claim 2,

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comprising:

a conveyer arrangement configured and disposed to remove bottles comprising a defective label from said labeling station; and

said fifth, inspecting, module is configured to output signals to permit removal of bottles comprising a defective label with said removing conveyer arrangement from said labeling station;

at least one of: (i) and (ii), wherein (i) and (ii) comprise:

(i) at least one of: said first, alignment, module and said second, alignment, module comprises a plurality of sensors each being configured and disposed to sense the degree of rotation of a container disposed on a support table;

(ii) a central control is operatively connected to said labeling station; and

one of: (a) and (b), wherein (a) and (b) comprise:

(a) one of: said first, alignment, module and said second, alignment, module is configured to correct, under instructions from said central control, the degree of rotation of a support table and a bottle supported thereon; and

(b) one of: said first, alignment, module and said second, alignment, module is configured to correct, under

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absence of instructions from said central control, the
degree of rotation of a support table and a bottle
supported thereon;

said fourth, printing, module comprises an arrangement
comprising one of: laser printing apparatus; laser marking apparatus;
ink jet printing apparatus; tampon printing apparatus; and screen
printing apparatus.

4-20. (canceled)